

Revision of the American Tiphid Genus *Quemaya* Pate (Hymenoptera: Tiphidae: Brachycistidinae)

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Abstract.—The brachycistidine genus *Quemaya* is reviewed and six new species are described from southern California, Arizona, northern Mexico and Costa Rica, *confusa*, *costaricensis*, *eurekaensis*, *megalops*, *mexicana*, and *sonorensis*.

The genus *Quemaya* Pate (1947) is an obscure group of nocturnal tiphids originally known from five species described from the southwestern deserts of North America, as far south as Sonora, Mexico. In this paper we more than double the known species in this genus, and extend the known distribution hundreds of miles. Additionally, intensive collecting in Costa Rica by the Instituto Nacional de Biodiversidad and by Frank Parker has turned up a new species from the arid northwestern region of Costa Rica. This region appears to be the southernmost extension of this arid nearctic desert habitat.

These wasps are easily overlooked because of their small size, dark coloration and nocturnal habits. However, males are strongly attracted to ultraviolet light sources at night. Females are as yet unknown. The new Costa Rican species, *costaricensis*, has some characteristics unusual for *Quemaya*, including the tiny ocelli and sculptured propodeum, but still has the diagnostic features for the genus discussed below.

Quemaya is characterized by a combination of primitive and derived features. The wing venation is reduced (Figs. 10-17). The forewing has only one, or less commonly two, submarginal cells, one discoidal and one subdiscoidal cell, and the marginal cell is separated from the costal wing margin. In the hindwing the cubital vein is nearly straight meeting the transverse cubital vein

at an angle much greater than 135°. *Quemaya* species lack the ventrally "tailed" antennal socket carina, forecoxal stridulatory structure, scrobal sulcus, mandibular carina, basal "ring" carina of the first gastral tergum, and carinate gastral sterna characteristic of other brachycistidine genera. Members of *Quemaya* all have a distinctly modified epipygium, that has sublateral carinae and an emarginate, truncate or convex apex (Figs. 18-21).

MATERIALS

Specimens in this study were obtained from: DAVIS—Bohart Museum of Entomology, University of California, Davis (S. L. Heydon); ITHACA—Department of Entomology, Cornell University, Ithaca, New York (J. Liebherr); LAWRENCE—Snow Entomological Museum, University of Kansas, Lawrence (R. Brooks); LOGAN—Department of Entomology, Utah State University, Logan (T. Griswold); OTTAWA—Canadian National Insect Collection, Agriculture Canada, Ottawa (L. Masner); RIVERSIDE—Department of Entomology, University of California, Riverside (S. Triapitsyn); SAN FRANCISCO—California Academy of Sciences, San Francisco (N. Penny); SANTO DOMINGO—Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica (C. M. Rodríguez); TUCSON—University of Arizona, Tucson; WASHINGTON—U.S. Na-

tional Museum of Natural History, Smithsonian Institution, Washington, D. C. (A. S. Menke, K. V. Krombein).

Two abbreviations are used below for the sake of brevity; MOD = midocellus diameter and F = flagellomere.

KEY TO SPECIES OF *QUEMAYA* (MALES)

- 1 Forewing with two submarginal cells (Figs. 10, 15, 16) 2
- Forewing with one submarginal cell (Figs. 11-14, 17) 5
- 2 Mandible with two apical teeth; distance between midocellus and closest eye margin less than 1.5 MOD (Fig. 1) *arenicola* Wasbauer
- Mandible with three apical teeth, one may be very small; distance between midocellus and closest eye margin more than 1.5 MOD 3
- 3 Mesopleuron densely punctate, with punctures evenly dispersed over entire surface and 1-2 puncture diameters apart; propodeum coarsely sculptured with irregular demarcation between dorsal and posterior surfaces indicated by rugae *confusa*, new species
- Mesopleuron sparsely punctate, with punctures generally 4-6 puncture diameters apart, denser dorsally than posteroventrally, surface above midcoxa nearly impunctate; propodeum smooth, without distinct punctation or rugosities, and no demarcation between dorsal and posterior surfaces 4
- 4 Midocellus separated from eye margin in frontal view by more than 2 MOD; epipygium apically bidentate *perpunctata* (Cockerell)
- Midocellus separated from eye margin in frontal view by more than 1 MOD but less than 2 MOD (Fig. 6); epipygium apically flat and broadly triangular (Fig. 19) ... *megalops*, new species
- 5 Gular carina with basal tooth-like projection near mandible (Fig. 25); clypeus transversely indented, without medial projection, arcuately raised apicomediaally (Fig. 5); epipygium apex truncate (as in Fig. 21) *inermis* (Malloch)
- Gular carina simple; clypeus medially bulging or with medial tooth; epipygium various 6
- 6 F-I and II subequal in length, about twice as long as broad or longer; epipygium apex strongly convex and lip-like (Fig. 20) *marcida* (Bradley)
- F-I shorter than II, and between 1.2 and 1.8 \times as long as broad; epipygium apex medially emarginate or truncate 7
- 7 Midocellus larger, separated by 2 MOD or less from nearest eye margin; F-I 1.6 \times as long as broad or longer 8
- Midocellus small, separated by 3 or more MOD from nearest eye margin; F-I 1.5 \times as long as broad or shorter 9
- 8 Midocellus separated from nearest eye margin by 1.5 MOD or less; epipygial apex convex; clypeus with broad, blunt medial projection, bulging and strongly subtriangular in profile; forewing R1 vein strongly angulate near costal margin, marginal cell broadly parallel-sided (as in Fig. 15) *mexicana*, new species
- Midocellus separated from nearest eye margin by 1.8-2.0 MOD; epipygial apex bidentate; clypeus with narrow noselike or almost digitate medial projection; forewing R1 vein narrowly separated from stigma, curved or indistinguishable near costal margin *paupercula* (Bradley)
- 9 Midocellus five or more MOD from nearest eye margin (Fig. 3); F-I 1.2 \times as long as broad; F-II 1.4 \times as long as broad; epipygium apex truncate (as in Fig. 21); propodeum coarsely sculptured, with irregular, partial transverse carina (Fig. 24) ... *costaricensis*, new species
- Midocellus 3.0-3.5 MOD from nearest eye margin; F-I 1.5 \times as long as broad; F-II 1.7-1.9 \times as long as broad; epipygium apex truncate or emarginate; propodeum smooth without sculpturing or transverse carina 10

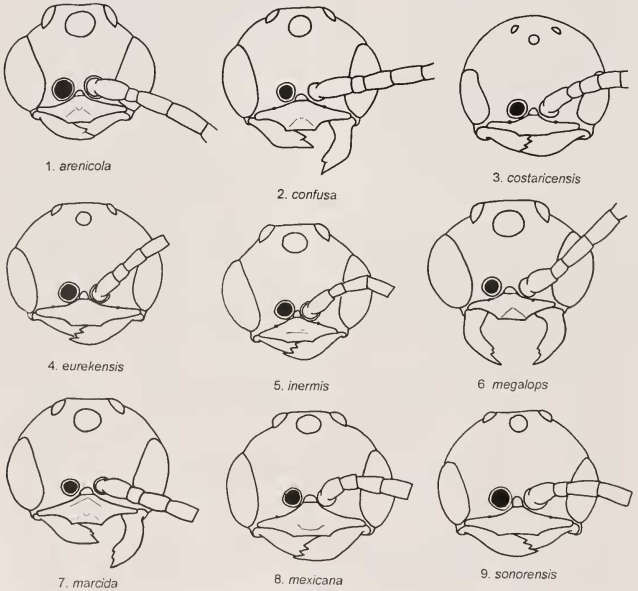
- 10 Clypeus with small, sharp medial projection, apical truncation 1.5 MOD wide (Fig. 4); epipygial apex medially emarginate, with sublateral carina *eurekaensis*, new species
- Clypeus with broad, transverse medial projection subtended by discrete declivity, apical truncation 2 MOD wide (Fig. 9); epipygial apex truncate *sonorensis*, new species

Quemaya arenicola Wasbauer
(Figs. 1, 10, 22)

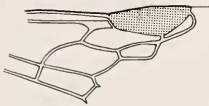
Quemaya arenicola Wasbauer 1967:169. Holotype male; California: Inyo Co., 6 mi w Glamis (SAN FRANCISCO, type No. 9306).

Male.—Body length 4–6 mm; clypeus with narrow apical truncation 0.6 MOD wide (Fig. 1); mandible with two apical

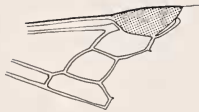
teeth; gular carina simple; F-I and II length twice breadth; interantennal distance 0.3 MOD wide; midocellus separated from nearest eye margin by 1.1–1.2 MOD; forewing with two submarginal cells, second cell triangular or subquadrate, completely underlying the first (Fig. 10); mesopleural punctures 0.2–0.5 puncture diameter apart; epipygium with sublateral carina



Figs. 1–9. Front view of male face, left antenna removed.



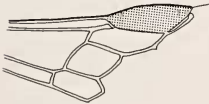
10. *arenicola*



11. *costaricensis*



18. *confusa*



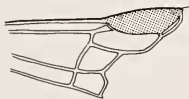
12. *eurekaensis*



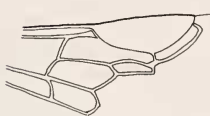
13. *inermis*



19. *megalops*



14. *marcida*



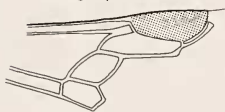
15. *megalops*



20. *marcida*



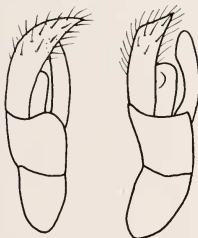
16. *perpunctata*



17. *sonorensis*



21. *eurekaensis*

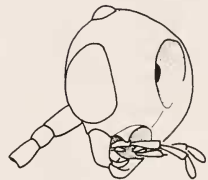


22. *arenicola*

23. *marcida*



24. *costaricensis*



25. *inermis*

Figs. 10-25. Figs. 10-17. Forewing venation. Figs. 18-21. Apex of epipygium (last gastral tergum). Figs. 22-23. Lateral view of male genital capsule. Fig. 24. Posterior view of male propodeum. Fig. 25. Oblique posterior view of male head, showing genal tooth.

ending in an apical lobe, apical margin medially emarginate; paramere subapically expanded, apical margin linear terminating in acute ventral angle (Fig. 22). Body color reddish brown; antennae pale red; wing veins clear and at most faintly tinted with dark brown stigma.

Material examined.—84 specimens from California: Imperial, San Bernardino, Riverside and San Diego Co.; Arizona: Yuma Co.; Mexico: Baja California Norte and Sonora.

Discussion.—This is one of the few *Quemaya* species with two submarginal cells. It can be immediately distinguished from the others with similar venation by having only two mandibular teeth and large ocelli narrowly separated from the eye margin.

***Quemaya confusa* Kimsey and
Wasbauer, new species**
(Figs. 2, 18)

Male.—Body length 4–6 mm long; face (Fig. 2): clypeus medially projecting and nose-like in profile, apical truncation medially emarginate or slightly trilobate and 1.3 MOD wide; mandible with three apical teeth, two subsidiary teeth considerably smaller than apical one; gular carina simple; F-I and F-II 1.7× as long as wide; distance between midocellus and closest eye margin 2 MOD; interantennal space 0.5 MOD wide; mesopleural punctures 0.5–1.0 puncture diameter apart; forewing with one submarginal cell; marginal cell rhomboid, apically broad and R1 angulate; epipygium apicomediaally emarginate, with two sublateral carinae forming an ovoid, slightly sunken, medial area and terminating in apical lobes (Fig. 18); paramere nearly parallel-sided, only slightly widened subapically before acute ventral angle. Body color black to dark brown; leg brown; antenna bicolored, paler ventrally than dorsally; wing veins pale brown-tinted, stigma dark brown; wing membrane untinted.

Etymology.—This species is named "confusa" because of the strong similarity

between it and other species of *Quemaya* found in the same localities.

Type material.—Holotype male: MEXICO: Sonora, 6 km nnw San Carlos, 11–15 July 1983, E. Fisher, malaise trap (DAVIS). Paratypes, 55 males (DAVIS, SAN FRANCISCO, RIVERSIDE, LAWRENCE, OTTAWA, WASHINGTON, TUCSON): two—USA: CALIFORNIA: Riverside Co., Blythe, 21 June 1963, F. D. Parker and L. A. Stange; one—Deep Canyon, 24 June 1964, E. I. Schlinger; one—Millard Cyn., 20 June 1963, E. I. Schlinger; two—Winchester, 10 July and 14 Aug. 1967, W. Icenogle; four—Imperial Co., 3 mi n Glamis, 15–16 Sept. 1977, M. Wasbauer & A. Hardy; one—Holtville, 8 July 1965, R. A. Flock; three—Chocolate Mts., Ogilby Rd., 3 mi s Jct. Hwy. 78, 16–21 Oct. 1977, M. Wasbauer; five—San Bernardino Co., 10 mi w 29 Palms, 27 May 1966, M. Wasbauer; two—NEW MEXICO: Dona Ana Co., Las Cruces, 2 June 1965, R. M. Bohart; one—2 mi. e Mesilla; ten—ARIZONA: Pinal Co., Marana, 6 July 1955, Butler & Werner; one—Maricopa Co., Gila Bend, Bohart & Butler, 12 Aug. 1954; one—Wickenburg, 10 Aug. 1950, H. K. Lloyd; one—Pinal Co., 10 mi. s Toltec, 21 June 1953, T. R. Haig; nine—4 mi. se Casa Grande, 18 June 1964, Smith & Baker; one—Pima Co., Continental, 17 July 1966, H. K. Court; one—TEXAS: Brewster Co., Chisos Mts. 10–12 June 1908, Mitchell & Cushman; one—MEXICO: Sonora, Cocorit, 23 May 1968, Parker & Stange; one—11 June, F. D. Parker; two—18 mi. e El Puerto, 7 Aug. 1960, Arnaud, Ross & Rentz; four—40 mi. n Hermosillo, 8 Aug. 1960, Arnaud, Ross & Rentz; one—6 km nnw San Carlos, 11–15 July 1983; one—4.9 mi n Magdalena, Rt. 15, 25 Aug. 1964, M. E. Irwin.

Discussion.—*Quemaya confusa* is another species with two submarginal cells. It can be distinguished from other species with this kind of wing venation by the densely and evenly punctate mesopleuron, coarsely sculptured propodeum, and mandibles with the normal three apical teeth. This

species is probably most similar to *perpunctata* and *megalops*.

***Quemaya costaricensis* Kimsey and
Wasbauer, new species**

(Figs. 3, 11, 24)

Male.—Body length 4.0–5.5 mm; face (Fig. 3): clypeus flat in profile, with apical truncation 2.5 MOD wide; mandible with three apical teeth, preapical teeth subequal in length; gular carina simple; F-I length $1.2\times$ breadth; F-II $1.4\times$ as long as broad; interantennal distance 0.9 MOD wide; distance from midocellus to closest eye margin 5.7 MOD; mesopleuron with punctures 1–2 puncture diameters apart; forewing with one submarginal cell; marginal cell small, more than $3\times$ as long as broad, widely separated from costal margin (Fig. 11); propodeum coarsely rugose dorsally, with broken irregular transverse ridge separating dorsal from posterior surfaces (Fig. 24) epipygium apicomediaally truncate, with two sublateral carinae above apex forming an ovoid, slightly sunken medial area; paramere gently tapering, apicoventral angle narrowly rounded. Body color black; antenna bicolored, paler ventrally than dorsally; wing veins pale brown, stigma dark brown; wing membrane slightly brown tinted.

Etymology.—This species is named after the country of collection, which is the southernmost record for the tiphiid subfamily Brachycistidinae.

Type material.—Holotype male: Costa Rica: Guanacaste Prov., 14 km s Cañas, F. D. Parker, 17 Feb. 1989 (LOGAN). Paratypes, 52 males (DAVIS, LOGAN, SANTO DOMINGO): eight—same data as holotype; one: 4–5 Mar. 1989; two—24 Feb. 1989; one—28–29 Jan. 1989; three—18 Feb. 1989; three—28 Feb. 1989; one—9 Mar. 1989; one—11–13 Jan. 1990; one—16 Feb. 1989; one—15–24 Feb. 1990; one—5 Mar. 1989; two—1–11 Feb. 1990; one—south of Cañas, 9–14 Feb. 1989, F. D. Parker; one—25–28 Feb. 1989; one—25 Feb.—8 Mar.

1989; twenty-one—Santa Rosa Natl. Pk., 21 Feb.—11–14 Mar. 1981.

Discussion.—There are many distinctive features of this species, which will immediately separate it from all other *Quemaya*, including: the tiny ocelli and small eyes, coarsely sculptured propodeum and short, broad flagellomeres. It is closest to *sonorensis* and *eurekaensis* based on the small ocelli, single submarginal cell and short broad flagellomeres.

***Quemaya eurekaensis* Kimsey and
Wasbauer, new species**

(Figs. 4, 12, 21)

Male.—Body length 3.5–4.0 mm; face (Fig. 4): clypeus with small, sharp medial projection, apical truncation 1.5 MOD wide; mandible with three apical teeth; gular carina simple, without tooth-like projection; F-I length $1.5\times$ breadth; F-II length $1.9\times$ breadth; interantennal distance 0.5 MOD wide; midocellus separated from nearest eye margin by 3.2 MOD; mesopleural punctures 3–6 puncture diameters apart; forewing with one submarginal cell (Fig. 12); epipygium with sublateral carinae each ending in an apical lobe, epipygial apex medially emarginate (Fig. 21); gonostylar shape apically narrowed into single acute apical angle. Body dark reddish brown, antennal and leg color pale reddish brown; wing veins untinted, except stigma dark reddish brown.

Etymology.—This species is known primarily from Eureka Valley, thus the name.

Type material.—Holotype male: California: Inyo Co., Eureka Valley, 13 July 1975, F. Andrews & A. Hardy (DAVIS). Paratypes, eight males (DAVIS, SAN FRANCISCO); six—same data as holotype; one—19 June 1972 Derham & Guiliani; one—Saline Valley dunes, 30 km e Independence, 26 May 1993, D. E. Russell, malaise trap.

Discussion.—The diagnostic features for *eurekaensis* are the small ocelli, separated from the eye margin by more than 3 MOD, medially emarginate epipygium

apex, and short F-I and II. This species is closest to *sonorensis* and less so *costaricensis*, but can be immediately distinguished from *sonorensis* by the sharp clypeal projection and emarginate epipygium. The larger ocelli and smooth propodeum will separate *eurekaensis* from *costaricensis*.

***Quemaya inermis* (Malloch)**
(Figs. 5, 13, 25)

Brachycistis inermis Malloch 1924:23. Holotype male; Arizona: Higley (WASHINGTON).

Male.—Body length 3–4 mm; face (Fig. 5): clypeus transversely indented, without medial projection, apical truncation 0.9 MOD wide; mandible with three apical teeth, preapical teeth subequal; gular carina with tooth-like projection near base of mandible (Fig. 25); forewing with one submarginal cell (Fig. 13); F-I and II length $1.7\times$ breadth; interantennal distance 0.8 MOD wide; midocellus separated from eye margin by 2 MOD; mesopleuron anterior part with punctures 1–3 puncture diameters apart, posteriorly nearly impunctate and polished; epipygium without sublateral carinae, only slightly indented apicomediaally; paramere gently tapering, apicoventral angle narrowly rounded. Body color reddish brown; antenna paler than body; wing veins and stigma nearly colorless.

Material examined.—239 specimens from: California: Riverside, San Bernardino, and Imperial Cos.; Arizona: Yuma, Santa Cruz and Maricopa Cos. Nevada: Lincoln Co.; Mexico: Sonora and Baja California Norte.

Discussion.—This is the only *Quemaya* species with a tooth-like projection on the gular carina; a feature typically found in members of the genus *Brachycistis*. *Quemaya inermis* can be immediately recognized by the transversely medially indented clypeus, and the apically truncate epipygium.

***Quemaya marcida* (Bradley)**
(Figs. 7, 14, 20, 23)

Brachycistis marcida (Bradley) 1917:283. Holotype male; USA: California, Imperial Co. (ITHACA).

Male.—Body length 3–5 mm; face (Fig. 7): clypeus with sharp medial projection, appearing nasiform in profile, apical truncation 1.7 MOD wide; mandible with three apical teeth; gular carina simple; F-I and F-II twice as long as broad; interantennal distance 0.6 MOD wide; midocellus separated from eye margin by 2.5 MOD; mesopleuron sparsely punctate, punctures 4–6 puncture diameters apart or more; forewing with one submarginal cell; marginal cell nearly parallel-sided, R1 vein strongly angulate and joining stigma at or below costal margin (Fig. 14); epipygium apicomediaally rounded and lip-like, with sublateral carina beginning above lip (Fig. 20); paramere apically truncate with apical margin concave (Fig. 23). Body reddish brown to brown; antenna and legs paler reddish brown than body color, forewing veins pale brown tinted; stigma brown.

Material examined.—873 specimens from CALIFORNIA: San Bernardino, Riverside and Imperial Cos.; Arizona: Yuma and Cochise Cos.; Nevada: Nye; Mexico: Sonora.

Discussion.—As with the majority of *Quemaya* species, *marcida* has one submarginal cell in the forewing and a simple gular carina. However, of these species only *marcida*, *arenicola* and *perpunctata* have the first two flagellomeres twice as long as broad. *Quemaya marcida* is the only one that has the epipygial apex strongly convex and lip-like. Additionally, the ocelli are large and narrowly separated from the nearest eye margin.

***Quemaya megalops* Kimsey and Wasbauer, new species**
(Figs. 6, 15, 19)

Male.—Body length 4–5 mm; face (Fig. 6): clypeus with large tuberculate medial projection, strongly nasiform in profile, apical truncation 0.9 MOD wide; mandible with three apical teeth, subsidiary ones considerably shorter than primary tooth; gular carina simple; F-I and II length $1.9\text{--}2.0\times$ breadth; interantennal distance 0.5 MOD wide; midocellus separated from eye

margin by 1.6 MOD; mesopleuron nearly impunctate; forewing with two submarginal cells, the second large, nearly rectangular and Rs aligned with 2rs-m; marginal cell large and parallel-sided with R1 vein strongly angulate before joining stigma at costal margin (Fig. 15); epipygium apically truncate, with distinct sublateral carinae, flat medially (Fig. 19); paramere lanceolate, narrowly tapering apically. Body reddish brown to brown with yellow legs and antenna; wing veins and stigma transparent and lightly yellow tinted.

Etymology.—*mega* = large, *ops* = eyes; f. (Gr.). The name refers to the greatly enlarged eyes and ocelli.

Type material.—Holotype male: California: Riverside Co., 5 mi nw Desert Center, 22 Oct. 1955, M. Wasbauer (DAVIS). Paratypes: 7 males (DAVIS, RIVERSIDE, SAN FRANCISCO); one—same data as holotype; two: Indio, Aug. 1977, Allen and Duffy (DAVIS); one—Magnesia Cyn. 2 July 1952; one—Inyo Co., 7 mi nne Panamint Spr., 15 May 1969, P. Rude; one—Arizona: Yuma Co., 4 mi w Salome, 8 June 1958, D & G. MacNeill; one—Mohawk, Apr. 1963, Timberlake.

Discussion.—This species most closely resembles *perpunctata* as both have two submarginal cells, a sparsely punctate mesopleuron and smooth propodeum. *Quemaya megalops* can be distinguished from *perpunctata* by the much larger ocelli, separated from the nearest eye margin by less than two midocellus diameters, pale stigma, and the very distinctive epipygium, which appears broadly triangular with the apex narrowly truncate. The wing venation is also diagnostic, with the second submarginal cell much larger than in other *Quemaya* species.

Quemaya mexicana Kimsey and Wasbauer, new species

(Fig. 8)

Male.—Body length 2.5–4.5 mm; face (Fig. 8): clypeus with broad, blunt medial projection, bulging and strongly subtri-

angular in profile, apical truncation 1 MOD wide; mandible with three apical teeth; gular carina simple; F-I-II 2.0–2.4× as long as broad; interantennal distance 0.4 MOD wide; midocellus separated from eye margin by 1.5–2.0 MOD; mesopleuron sparsely punctate, punctures 4–6 puncture diameters apart or more; forewing with one submarginal cell; marginal cell nearly parallel-sided, R1 vein strongly angulate and joining stigma at or below costal margin; epipygium apicomedialex convex, otherwise similar to *sonorensis*; gonostylar apex truncate, with apical margin linear. Body brown to dark brown; antenna and legs paler reddish brown than body color, forewing veins pale brown tinted; stigma brown.

Etymology.—The name refers to the preponderance of specimens having been collected in northern Mexico.

Material examined.—Holotype male: MEXICO: Baja California Norte, 1 km s El Rosario, 24–25 July 1992, D. E. Russell, MT (DAVIS). Paratypes: 46 males (DAVIS): 37—Diablo Cyn, Dry Lake, 16 July 1979, D. Giuliani; four—same data as holotype; three—eastern base of Sierra de Juarez below Rumorosa, 11 Sept. 1961, I. L. Wiggins; one—USA: California, Andrade, 4 Aug. 1966, M. Wasbauer; one—Calexico, 19 June 1969.

Discussion.—This species closely resembles *marcida* as discussed under that species. However, *mexicana* can be readily distinguished from *marcida* by the shorter flagellomeres, broad blunt clypeal projection, and distinctively convex epipygial apex.

Quemaya paupercula (Bradley)

Brachycistis paupercula Bradley 1917:282. Holotype male; California: Calexico (ITHACA, type No. 129.1)

Male.—Body length 3–4.5 mm; clypeus with medial nose-like projection in profile, apical truncation 1.1 MOD wide; mandible with three apical teeth; gular carina sim-

ple; F-I and II length $1.6\times$ breadth; interantennal distance 0.3 MOD wide; midocellus separated from eye margin by 1.9 MOD; mesopleural punctures almost absent; forewing with one submarginal cell; marginal cell narrow, closed on costal margin; epipygial apex truncate, subapically concave; paramere nearly parallel-sided, apex abruptly truncate, with acute ventral and dorsal angle and apical margin somewhat concave between. Body color dark brown; antenna paler than body; wing veins nearly colorless, except stigma dark brown.

Material examined.—109 specimens from California: Riverside, Imperial, Kern, San Bernardino and San Diego Co.; Arizona: Coconino, Yuma Co.; Nevada: Lincoln Co.; Texas: Brewster Co. and Presidio Co.; New Mexico: Dona Ana Co.; Mexico: Baja California Norte and Sonora.

Discussion.—*Quemaya paupercula* is one of the most commonly collected species of the genus. It is most readily confused with *eurekaensis*, which has a very restricted distribution. Both species have a medially emarginate epipygial apex, short flagellomeres, two submarginal cells and a simple gular carina. However, the larger size of the ocelli will readily separate *paupercula* from *eurekaensis*.

Quemaya perpunctata (Cockerell)
(Fig. 16)

Brachycistis perpunctata Cockerell 1896:291. Holotype male; New Mexico: Las Cruces (PHILADELPHIA).

Male.—Body length 4.0–5.5 mm; clypeus with low medial projection, apical margin 1 MOD wide; mandible with three apical teeth; gular carina simple; F-I length twice breadth; F-II $2.2\times$ as long as broad; interantennal distance 0.5 MOD wide; midocellus separated from eye margin by 2.8 MOD; forewing with two submarginal cells, second cell triangular or subquadrate, completely underlying the first (Fig. 16); mesopleural punctures 1–2 puncture

diameters apart, nearly impunctate above midcoxa; epipygium with sublateral carinae each ending in an apical lobe, epipygial apex medially emarginate; paramere expanded subapically, apex truncate, apical margin linear, between two acute angles. Head and body dark brown to black, except antennae, clypeal apex, palpi and tegula reddish brown, mandibles and tarsi yellow, femora and tibiae brown; stigma dark brown, nearly black, veins brown.

Material examined.—249 specimens from California: San Bernardino, Riverside, Imperial and San Diego Cos.; Nevada: Lincoln Co.; Texas: Brewster Co.; Arizona: Yuma Co.; Mexico: Baja California Sur.

Discussion.—The most striking feature of this species is the wide range of variation in coloration. This variation appears to be geographically correlated. In California specimens some red is always present on at least the head. The prothorax and often the entire thorax may also be red, giving the specimen a strongly bicolored appearance. Otherwise, *perpunctata* can be recognized by having two submarginal cells, three mandibular teeth, propodeum without distinct sculpturing, and small ocelli.

Quemaya sonorensis Kimsey and
Wasbauer, new species
(Figs. 9, 17)

Male.—Body length 3.5–4.0 mm; face (Fig. 9): clypeus with broad transverse medial projection subtended by discrete declivity, apical truncation 2 MOD wide; mandible with three apical teeth; gular carina simple; F-I length $1.5\times$ breadth; F-II length $1.7\times$ breadth; interantennal distance 0.7 MOD wide; midocellus separated from eye margin by 3 MOD; mesopleuron smooth, punctures 1–4 puncture diameters apart becoming sparser above midcoxa; forewing with one submarginal cell, venation as in *paupercula* (Fig. 17); epipygium apex truncate; paramere as in *costaricensis*. Body and antennal color pale

reddish brown; wing veins untinted, except stigma reddish brown.

Etymology.—The type series of this species is from Sonora, Mexico; thus the name.

Type material.—Holotype male: MEXICO: Sonora, 6 km nnw San Carlos, 11–15 July 1983, E. Fisher, MT (DAVIS). Paratypes: 11 males (DAVIS), same data as holotype.

Discussion.—The small ocelli, short flagellomeres, single submarginal cell, truncate epipygial apex and lack of a gular tooth distinguish *sonorensis* from most other *Quemaya* species, except *eurekaensis* and *costaricensis*. *Quemaya sonorensis* can be distinguished from these two species by the larger ocelli and flagellomeres I and II 1.5× as long as broad or longer, not shorter as in *costaricensis*, narrow clypeal truncation and broad transverse clypeal projection.

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